No. 200700270

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Rutgers, The State University of New Jersey

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

FESCUE, RED

'Epic'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of Washington, D.C. this sixteenth day of May, in the year two thousand and eight.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions* — Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
Rutgers, The State University of New Jersey

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
5001

3. VARIETY NAME
Epic

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
Foran Hall
Plant Biology & Pathology Dept.
59 Dudley Road
New Brunswick, NJ
08901

5. TELEPHONE *(include area code)*
(732) 932-9711

6. FAX *(include area code)*
(732) 932-9441

FOR OFFICIAL USE ONLY

PVPO NUMBER
200700270

FILING DATE
4/12/2007

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Government Institution

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

9. DATE OF INCORPORATION

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Dr. William Meyer
c/o Rutgers University
Foran Hall
Plant Biology & Pathology Dept. 59 Dudley Road
New Brunswick, NJ
08901
(BT: 11/2/2007)

FEES RECEIVED

FILING AND EXAMINATION FEES:
$ 4,382.00
DATE 4/12/2007

CERTIFICATION FEE:
$ 768.00
DATE 3/6/2008

11. TELEPHONE *(Include area code)*
(732) 932-9711

12. FAX *(Include area code)*
(732) 932-9441

13. E-MAIL

14. CROP KIND *(Common Name)*
Strong Creeping Red Fescue

16. FAMILY NAME *(Botanical)*
Poaceae

15. GENUS AND SPECIES NAME OF CROP
Festuca rubra rubra

17. IS THE VARIETY A FIRST GENERATION HYBRID?
☐ YES ☑ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (***OPTIONAL***)
☐ YES ☑ NO
IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERICALIZATION. _____

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
(Follow instructions on reverse)

a. ☑ Exhibit A. Origin and Breeding History of the Variety
b. ☑ Exhibit B. Statement of Distinctness
c. ☑ Exhibit C. Objective Description of Variety
d. ☑ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☑ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☑ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
g. ☑ Filing and Examination Fee ($3,652), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*
☑ YES *(If "yes", answer items 21 and 22 below)* ☐ NO *(If "no", go to item 23)*

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
☑ YES ☐ NO
IF YES, WHICH CLASSES? ☑ FOUNDATION ☑ REGISTERED ☑ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☑ YES ☐ NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
1 FOUNDATION 2 REGISTERED 3 CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
☐ YES ☑ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES ☑ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. **The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.**

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
		Bradley Hillman	
NAME *(Please print or type)*		NAME *(Please print or type)*	
		Dr. Bradley Hillman	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
		Director of Research & Associate Director, NJAES	4/10/07

(See reverse for instructions and information collection burden statement)

ST-470 (04-03) designed by the Plant Variety Protection Office using Word 2002.

Exhibit A:

Origin and Breeding History

Epic Strong Creeping Red Fescue

1. Epic strong creeping red fescue (*Festuca rubra* L. subsp. *rubra*) is a tuf-type cultivar selected for dark green color, increased shoot density, leaf spot resistance and improved turf quality from the progenies of 13 clones.

Sixty-two percent of the harvested plants trace their maternal origin to a plant found in the Rose City Cemetery, Portland, OR. This plant contained a *Neotyphodium* endophyte currently referred to as the Rose City endophyte. The other 38% of the germplasm traces their maternal origin to a few plants selected from Atlantic City, NJ and contained a *Neotyphodium* endophyte currently referred to as the AC-1 endophyte. These plants underwent several cycles of selection and were pollinated by plants collected from old turf of the United States during the period from 1962 through 1990 by turfgrass scientist at the New Jersey Agricultural Experiment Station.

Plants selected from old turfs were subjected to evaluation in spaced-plant nurseries, frequently mowed turf trials, and greenhouse test for resistance to powdery mildew (caused by *Erysiphe graminis* DC). Progenies from intercrossing the best performing selections were then subjected to many cycles of recurrent phenotypic selection with each cycle followed by single-plot progeny tests in closely mowed turf trial. Tillers were subsequently selected from the best performing turf plots to initiate additional cycles of selection. Greenhouse facilities were also used to select disease resistant, lower-growing plants with abundant tillers, and a rich, bright, dark green color.

The most promising plants were identified by their persistence, appearance and performance in spaced-plant nurseries, mowed clonal evaluation tests and single-plant progeny trials under turf maintenance. Intercrosses of the best performing plants were subjected to varying cycles of phenotypic and genotypic selection depending on their date of collection. New sources of germplasm were added to the breeding program as it became available from the continuing collection program. Each cycle of selection showed continued progress in producing lower-growing, darker green, finer leaf texture, attractive plants with improved turf performance scores.

A nursery was established in the fall of 2001 consisting of 1,200 plants selected from the best performing progenies from the 1998 fine fescue trial at Adelphia, NJ. After a period of drought and heat stress and stem rust disease in the summer and fall of 2002, nineteen clones were selected from this nursery. These plants were vegetatively propagated and planted in a randomized complete block design with six replications in the spring of 2002. Plants were selected for low growth habit, fine leaf texture and medium green color. In the spring of 2003, six clones were removed prior to anthesis for poor seed yield potential, disease susceptibility, light green color and non-uniform maturity. Seed was subsequently harvested from the remaining 13 clones to produce approximately 24.5 pounds of breeder seed. Twelve pound was sent to Beltsville, MD, USDA-ARS to include in the National Turfgrass Evaluation Program's - 2003 National Fine Fescue test. A pound of seed was sent to ASP Research for inclusion in a morphological nursery.

2. Breeder Seed Maintenance:

A breeder seed multiplication was planted in isolation in 2002, in Adelphia, NJ. Seed was harvested in bulk in 2003 and is maintained in cold storage. Seed propagation is limited to three generations, one each of foundation, registered, and certified.

3. Stability and Uniformity:

Epic has been a stable uniform cultivar over 2 generations. No off-type or variant plants have been observed during the multiplication or reproduction. Turf plots of Epic have been uniform and stable.

Exhibit B:

Novelty Statement of Epic Strong Creeping Red Fescue

The following summary outlines the distinctive characteristics of Epic. The novelty of Epic is based on the unique combination of these characteristics. Epic is most similar to Boreal, but may be differentiated by using the following criteria:

1) The heading date and anthesis date of Epic is earlier than Boreal (tables 1A, 1B).

2) The flag leaf morphological characteristics; height, length, sheath length, and internode length of Epic are significantly shorter compared to Boreal (tables 1A, 1B).

3) The leaf blade characteristics; length, width, height, and sheath length of Epic are shorter than Boreal (tables 1A, 1B).

4) Epic has a reduced glume length compared to Boreal (tables 2A, 2B)

5) The length of the spikelet for Epic is shorter compared to Boreal (tables 2A, 2B).

6) Epic expresses a higher frequency of plants with an erect growth habit compared to Boreal (tables 5A, 5B).

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURE MARKETING SERVICE
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Fine Leaved Fescues)

OBJECTIVE DESCRIPTION OF VARIETY
FINE LEAVED FESCUES
(Festuca spp.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME.
Rutgers, The State University of NJ	5001	Epic

ADDRESS *(Street and No. or R.F.D. No., City, State, Zip Code)*
Foran Hall
Plant Biology & Pathology Dept.
59 Dudley Road New Brunswick, NJ 08901

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PVPO NUMBER #200700270

Place the appropriate number that describes the varietal character of this variety in the boxes below. Use leading zeroes when necessary: (e.g., 0 8 or 0 9). Characteristics described including numerical measurements, should represent those that are typical for the variety. Measured data should be for SPACED PLANTS. Royal Horticulture Society or any recognized color fan may be used to determine plant colors; designate system used: _____

_____ Describe location of test area, conditions and number of plants used: _____
See section 16, page 4.

1. SPECIES: (With comparison varieties for use below - use varieties within species of application variety)

____	1 = *F. rubra ssp. commutata* (Chewings)	11 = Cascade 14 = Banner	12 = Highlight 15 = Barfalla	13 = Jamestown
____	2 = *F. rubra ssp. litoralis* (Creeping Red)	21 = Dawson 24 = Pennlawn	22 = Starlight	23 = Merlin
31	3 = *F. rubra ssp rubra* (Spreading Red)	31 = Boreal 34 = Ensylva		
____	4 = *F. ovina* (Sheep)	41 = Covar		
____	5 = *F. longifolia* (Hard)	51 = Durar	52 = Biljart (C-26)	53 = Scaldis
____	6 = *F. tenuifolia* (Fine-Leaved Sheep)	61 = Panda	62 = Barok	
____	7 = Other *(Specify)* F._____			

2. CYTOLOGY:
5 6 Chromosome Number 4 Ploidy 1 = diploid 2 = tetraploid 3 = hexaploid 4 = octoploid

3. ADAPTATION: (0 = Not Tested; 1 = Not Adapted; 2 = Adapted)
2 Northeast 0 Southeast 0 North Central 2 Pacific N.W. ____ Other *(Specify)* _____

4. MATURITY: Date First Headed (panicle emergence) Location(s) of Trial(s)_____
2 Maturity Class:
1 = Very Early (Covar) 2 = Early (Highlight) 3 = Medium Early (Boreal, Dawson)
4 = Medium Late (Cascade, Ruby) 5 = Late (Jamestown, Agram) 6 = Very Late

Date Headed 44. 25 days after March 1,

3.50	Days earlier than	31	Comparison Variety
___	Maturity same as	___	
___	Days later than	___	

5. Plant Height: (At maturity; to top of panicle; Average of 10 culms)

699. 50 mm height

148.80	mm shorter than	31	Comparison Variety
	Height same as	___	
___	mm taller than	___	

6. GROWTH HABIT: (Mature)
1 1 = Erect (Ruby) 2 = Semi-erect (Highlight) 3 = Prostrate (Silvana)

7. RHIZOMES:
___ mm Length ___ mm Width ___ mm Internode length
2 1 = Absent (Highlight) 2 = Weakly Creeping (Dawson) 3 = Strongly Creeping (Boreal) 4 = Very Strongly Creeping (Fortress)

#200700270

8. LEAF BLADE:

4 Color: 1 = Light Green (Strarlight) 2 = Medium Light Green (Highlight) 3 = Medium Dark Green (Ruby, Agram) 4 = Dark Green (Jamestown, Manoir) 5 = Bluegreen (Saphir) 6 = Graygreen (Scaldis) 7 = Other (*Specify*) _____

1 Glaucosity (Sowing Year): 1 = Absent (Koket) 2 = Present (Vendrome)

1 Anthocyanin: 1 = Absent 2 = Present 2 (68%) Hairs (Basal) 1 = Absent 2 = Present

1 (64%) Margins: 1 = Smooth 2 = Semi-rough 3 = Rough

1 Margin folding (closure): 1 = Rolled inward (closed-Highlight) 2 = Flat (open-Jamestown, Engina)

3 Width class: 1 = Very Fine (Agram, Frida) 2 = Fine (Jamestown, Highlight, Banner, Dawson) 3 = Medium Fine (Fortress, Ruby, Scaldis) 4 = Medium Coarse (Engina)

196.00 mm Length (flag leaf)

97.80 mm Shorter than . . . . . 31 } Comparison Variety

Blade length same as . . . . . |

| mm Longer than . . . . . |

3.10 mm Width (flag leaf)

▲ | mm Narrower than . . . . . | } Comparison Variety

Blade width same as 31

▲ | mm Wider than . . . . . |

9. LEAF SHEATH:

____ Anthocyanin (seedling): 1 = Absent (Highlight) 2 = Present (Jamestown, Fortress, Marga)

2 Auricle Hairiness: 1 = Absent 2 = Present

1 Margins: 1 = Open (Highlight) 2 = Closed (Jamestown)

10. PANICLE (Mature plant):

3 Shape: 1 = Narrow-tapering 2 = Ovate 3 = Oblong 4 = Other (*Specify*) _____

1 Type: 1 = Open 2 = Intermediate 3 = Compact

1 Orientation: 1 = Erect 2 = Nodding

1 Branch Pubescence: 1 = Glabrous 2 = Pubescent

1 Anther Color: } 1 = Yellowish Green 2 = Green 3 = Bluish Green 4 = Purplish

1 Glume Color (At 50% flowering): } 5 = Reddish 6 = Other (*Specify*) _____

—

(BT:11/2/07) 48.13 ~~mm~~ cm Length

~~0.12~~ 0.12 ~~mm~~ cm Shorter than . . . . . 31 } Comparison Variety

Panicle length same as . . . . . |

| ~~mm~~ cm Longer than . . . . . |

11. PALEA:

2 Hairs (On keels or margins): 1 = Absent (Banner) 2 = Short (BT:11/2/2007) (Agram, Scaldis, Olds) 3 = Long (Ranier, Fortress, Jamestown)

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12. LEMMA (Mature):

2 Hairs: 1 = Absent (Jamestown) 2 = Several 3 = Many (Highlight)

5.58 mm Lemma Length

___ mm Shorter than . . . . . ___

Lemma length same as . . . . . 31 } Comparison Variety

___ mm Longer than . . . . . ___

0.82 mm Lemma Width

___ mm Narrower than . . . . . ___

Lemma width same as . . . . . 31 } Comparison Variety

___ mm Wider than . . . . . ___

2 Awns: 1 = Absent 2 = Present

1.49 mm Awn Length

___ mm Shorter than . . . . . ___

Awn length same as . . . . . 31 } Comparison Variety

___ mm Longer than . . . . . ___

13. SEED (With lemma & palea):

2 Size Class (g/1000 seed):
1 = <.9g (Biljart, Dawson) 2 = .91-< 1.1g (Jamestown, Highlight)
3 = 1.1 - 1.3 g (Fortress, Novorubra) 4 = > 1.3g (Boreal, Golfrood)

1,217.00 mg per 1000 seed

___ mg per 1000 seed less than . . . . . ___

Seed Weight same as . . . . . ___ } Comparison Variety

176.00 mg per 1000 more than 31

14. DISEASE, INSECT, AND NEMATODE REACTION (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

0	Melting-out *Drechslera poae* (*Helminthosporium vagans*)	0	Stripe rust *P. striiformis*
0	Leaf spot *D. siccans*	0	Leaf rust *P. poae-nemoralis*
0	Net blotch *D.* dictyoides	0	*P. crandalli*
0	Leaf spot *Bipolaris sorkiniana*	0	Pythium Blight *Pythium ultimum*
0	Brown patch *Rhizoctonia solani*	0	Red thread *Corticum fusciforme*
0	Powdery Mildew *Erysiphe graminis*	0	Dollar spot *Sclerotinia homoeocarpa*
0	Stripe smut *Ustilago striiformis*	0	Insect _____
0	F. Patch, Pink snow-mold *Fusarium nivale*	0	Nematode _____
0	Fusarium blight *F. tricinctum, F. roseum*	0	Other _____
0	Gray snow mold *Typhula iotana*	0	Other _____
0	Stem rust *Puccinia graminis*	0	Other _____

15. GIVE VARIETY OR VARIETIES THAT MOST CLOSELY RESEMBLE THE APPLICATION VARIETY. For the following characteristics indicate Degree of Resemblance by placing the column marked, D. R., 1 of the following numbers:

1 = Application variety is less than comparison variety. 2 = Same As
3 = More than, better, greater, darker, more disease resistant, etc.

CHARACTER	VARIETY	D. R.	CHARACTER	VARIETY	D.R.
Rhizome Length	Boreal	1	Growth Habit	Boreal	3
Leaf Width	Boreal	2	Leaf Color	Boreal	3
Panicle Color	Boreal	3	Panicle Shape	Boreal	3
Winter Color	Boreal	3	Cold Injury	Boreal	2
Shade Tolerance	Boreal	2	Heat	Boreal	2
Drought	Boreal	2	Disease*	Boreal	2

* *Specify each disease evaluated.*

16. ADDITIONAL DESCRIPTION: (Use additional sheets as required)
Describe all characteristics that cannot be adequately described in the form above in Exhibit D. Comparative varieties should be used as may be appropriate, such as for disease. Append all comparative trial and evaluation data, including measured characters, environmental, and disease test.

A morphological nursery designated 04PVPFRR was established in September 2004, in Albany, Oregon. Experimental design consisted of 4 entries;4 replications per entry; 20 plants per replication; for a total of 80 plants per entry. Boreal was used as a standard. Plants were established on 2.5 foot centers with a skip row between replications and between entries.

The nursery received 30 pounds of nitrogen per acre rate following establishment and 50 pounds of nitrogen per acre per year in 2004 and 2005. The fertilizer source was 15 - 15 - 15 and was applied as a split application with ½ applied in the spring and ½ in the autumn. The nursery was sprayed twice each spring, 3 weeks between applications, with Tilt (2oz/acre rate), to prevent stem rust. One pound of Karmex per acre rate was applied during the late summer to prevent emergence of volunteer seedlings.

Data was analyzed using analysis of variance for a randomized complete block design. Means were calculated for each replication and then analyzed for tables 1A, 1B, 2A, and 2B.

Tables 3A, 3B, 4A, 4B, 5A, and 5B data were analyzed using binary data confidence intervals. The confidence intervals are given for the characteristics which expressed significant differences.

Exhibit D:

Additional Description

Epic Strong Creeping Red Fescue

Epic has improved characteristics over current cultivars, such as Boreal, Flyer, and Shademaster. Epic has an early maturity, with a heading date and anthesis date earlier than Boreal, but later than Flyer (tables 1A, 1B). The mature plant height of Epic is shorter compared to Boreal, Flyer and Shademaster (tables 1A, 1B). The panicle length of Epic is shorter than Boreal, Flyer and Shademaster (tables 1A, 1B). The flag leaf characteristics; length, height, sheath length and internode length of Epic are all shorter compared to Boreal, Flyer and Shademaster (tables 1A, 1B). The leaf blade measurements; length, height and sheath length of Epic are shorter than Boreal, Flyer and Shademaster (tables 1A, 1B). Epic has a reduced glume length compared to Boreal, Flyer and Shademaster (tables 2A, 2B). Epic has a shorter spikelet than Boreal, Flyer and Shademaster (tables 2A, 2B). The length of the longest branch of the lower most whorl is shorter for Epic than Boreal, Flyer, and Shademaster (tables 2A, 2B, illus. 1). The distance between the two most lower whorls is less for Epic compared to Boreal, Flyer and Shademaster (tables 2A, 2B). Epic also has fewer spikelets per panicle than Boreal and Shademaster (tables 2A, 2B).

Epic exhibits more plants with red pigmentation of the panicle compared to Flyer (tables 3A, 3B). Epic expresses fewer plants with a compact panicle type compared to Flyer (tables 3A, 3B). Epic has a lower seed weight than Boreal, Flyer and Shademaster (tables 5A, 5B).

Table 1A

2005 Morphological Data

Cultivar	Heading Date days after March 1	Anthesis Date days after March 1	Genetic Color (Scale: 1-9 9=Darkest) (BT: 5/8/07)	Mature Plant Height (cm)	Plant Width (cm)	Panicle Length (cm)	Flag Leaf Length (cm)	Flag Leaf Width (mm)	Flag Leaf Height (cm)	Flag Leaf Sheath Length (cm)	Flag Leaf Internode Length (cm)	Leaf Blade Length (cm)	Leaf Blade Width (mm)	Leaf Blade Height (cm)	Leaf Sheath Length (cm)
(BT: 5/8/07) 5001 = Epic	44.25	54.00	5.55	55.73	22.25	48.13	19.60	3.90	17.70	10.75	6.43	14.88	3.90	6.35	6.18
Boreal	47.75	57.00	4.78	73.18	21.63	62.85	29.38	4.40	28.28	17.13	9.68	22.00	4.40	10.58	9.40
Flyer	35.50	48.50	4.88	84.15	21.70	73.53	27.40	3.80	27.18	16.93	10.38	18.95	3.63	8.65	9.10
Shademaster	35.75	51.50	4.80	84.60	20.90	73.58	28.28	4.10	27.30	16.98	10.40	19.15	3.65	8.75	8.95
LSD 5%	2.54	1.47	0.12	3.97	1.41	3.91	1.37	0.54	1.03	0.82	1.15	1.53	0.30	0.57	0.52
C.V.	4.80	2.14	1.83	4.12	5.02	4.67	4.03	10.23	3.17	4.10	9.62	6.28	6.03	5.12	4.76

■ Cultivar under evaluation
▩ Significant difference over two years one locations.
▩ Significant difference over one year one location.
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

Table 1B

2006 Morphological Data

Cultivar	Heading Date days after March 1	Anthesis Date days after March 1	Genetic Color (Scale: 1-9 9=Darkest) (BT: 5/8/07)	Mature Plant Height (cm)	Plant Width (cm)	Panicle Length (cm)	Flag Leaf Length (cm)	Flag Leaf Width (mm)	Flag Leaf Height (cm)	Flag Leaf Sheath Length (cm)	Flag Leaf Internode Length (cm)	Leaf Blade Length (cm)	Leaf Blade Width (mm)	Leaf Blade Height (cm)	Leaf Sheath Length (cm)
(BT: 5/8/07) 5001 = Epic	44.25	49.00	5.50	69.95	44.85	54.05	25.83	3.10	31.25	14.43	11.10	21.55	2.78	14.35	9.75
Boreal	47.75	51.50	5.60	84.83	48.98	66.05	36.88	3.58	39.68	20.18	13.13	28.48	3.35	18.03	12.45
Flyer	37.25	46.25	5.60	90.35	45.28	68.88	31.23	2.70	40.53	19.38	15.13	23.68	2.60	16.65	11.25
Shademaster	39.75	48.00	5.58	90.48	44.30	68.08	31.18	2.65	40.00	19.08	15.63	23.93	2.45	16.20	12.00
LSD 5%	2.59	1.89	0.26	3.83	2.51	3.21	1.29	0.39	2.71	0.79	1.46	1.31	0.35	1.59	1.08
C.V.	4.73	2.99	3.57	3.52	4.22	3.86	3.18	10.01	5.52	3.33	8.17	4.15	9.66	7.53	7.34

■ Cultivar under evaluation
▩ Significant difference over two years one location.
▩ Significant difference over one year one location.
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

Table 2A 2005 Laboratory Morphological Data

Cultivar	Lemma Length (mm)	Lemma Width (mm)	Lemma Awn Length (mm)	Glume Length (mm)	Florets per Spikelet	Spikelet Length (mm)	Length of Longest Whorl (mm)	Distance Between Lower Most Whorls (mm)	Number of Spikelets on the Longest Whorl	Spikelets per Panicle	Length of Panicle from Lower Most Whorl to Tip (mm)
5001 = Epic	5.83	1.08	1.49	4.53	6.75	14.53	55.40	30.45	6.00	33.50	103.93
Boreal	6.50	1.11	1.94	5.50	7.25	17.35	89.45	46.83	9.25	44.00	158.40
Flyer	6.35	1.11	1.81	5.30	6.75	16.50	76.40	44.03	7.00	36.00	144.40
Shademaster	6.08	1.05	1.90	5.35	6.75	15.98	72.50	40.78	8.00	42.75	143.90
LSD 5%	0.27	0.05	0.15	0.19	0.65	0.99	6.64	2.67	0.87	3.29	10.83
C.V.	3.42	3.52	6.58	2.89	7.27	4.77	6.98	5.08	8.88	6.50	6.07

■ Cultivar under evaluation
■ Significant difference over two years one location.
■ Significant difference over one year one location.
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

Table 2B 2006 Laboratory Morphological Data

Cultivar	Lemma Length (mm)	Lemma Width (mm)	Lemma Awn Length (mm)	Glume Length (mm)	Florets per Spikelet	Spikelet Length (mm)	Length of Longest Whorl (mm)	Distance Between Lower Most Whorls (mm)	Number of Spikelets on the Longest Whorl	Spikelets per Panicle	Length of Panicle from Lower Most Whorl to Tip (mm)
5001 = Epic	5.58	0.82	1.89	4.50	6.25	12.68	59.70	32.75	6.00	35.75	124.93
Boreal	5.93	0.89	2.06	5.23	6.75	14.80	94.60	47.45	6.25	45.25	184.85
Flyer	5.68	0.87	1.94	4.93	6.50	14.68	77.98	44.98	5.25	33.25	161.10
Shademaster	5.65	0.85	2.07	5.23	6.25	13.75	76.75	43.65	6.50	41.25	168.28
LSD 5%	0.40	0.04	0.41	0.33	0.69	0.71	5.75	2.60	0.68	2.15	6.95
C.V.	5.47	3.32	16.05	5.11	8.29	3.92	5.74	4.74	8.78	4.27	3.35

■ Cultivar under evaluation
■ Significant difference over two years one location.
■ Significant difference over one year one location.
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

(per applicant's authorization)

#20070270

11.

Panicle Type Inflorescence

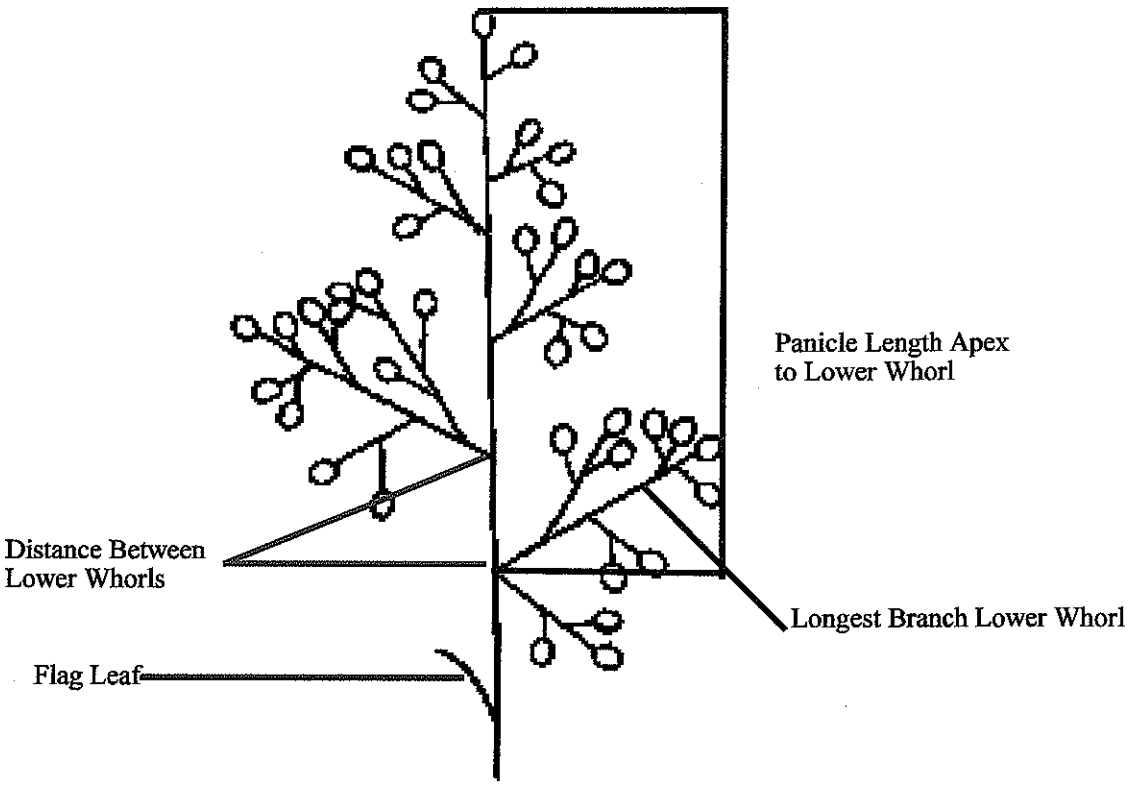

Illustration 1.

Table 3A

2005 Morphological Measurements of the Panicle

Cultivar	Anther Color % Yellow	Anther Color % Purple	Panicle Color			Glume Color % Purple	Panicle Orientation % Nodding	Panicle Shape % Narrow	Panicle Shape Oblong	Panicle Type % Open	Panicle Type			Percent Branches of Lower Whorl =1	Percent Branches of Lower Whorl =2	Percent Branches of Lower Whorl >3	Panicle Branch Pubescence % Present
			% Red	Lower CI	Upper CI						% Compact	Lower CI	Upper CI				
(BT: 5/8/07) 5001 = Epic	53	48	94	0.888	0.992	82	0	11	89	89	11	0.041	0.179	23	71	6	2
Boreal	76	24	64	0.535	0.745	66	100	58	43	43	58	0.472	0.688	29	56	15	16
Flyer	71	29	66	0.556	0.764	64	100	45	55	55	45	0.341	0.559	41	49	10	18
Shademaster	80	20	69	0.589	0.791	70	100	30	70	70	30	0.200	0.400	24	63	13	15

■ Cultivar under evaluation
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points
CI = Confidence Interval

Table 3B

2006 Morphological Measurements of the Panicle

Cultivar	Anther Color % Yellow	Anther Color % Purple	Panicle Color			Glume Color % Purple	Panicle Orientation % Nodding	Panicle Shape % Narrow	Panicle Shape Oblong	Panicle Type % Open	Panicle Type			Percent Branches of Lower Whorl =1	Percent Branches of Lower Whorl =2	Percent Branches of Lower Whorl >3	Panicle Branch Pubescence % Present
			% Red	Lower CI	Upper CI						% Compact	Lower CI	Upper CI				
(BT: 5/8/07) 5001 = Epic	98	2	71	0.611	0.809	38	15	18	83	83	18	0.096	0.264	11	84	5	4
Boreal	91	9	58	0.472	0.688	34	19	21	79	79	21	0.121	0.299	8	84	8	4
Flyer	99	1	45	0.341	0.559	35	29	39	61	61	39	0.283	0.497	22	68	10	5
Shademaster	100	0	56	0.472	0.669	23	17	30	70	70	30	0.200	0.040	9	14	7	2

■ Cultivar under evaluation
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points
CI = Confidence Interval

Table 4A 2005 Additional Measurements of the Leaf Blade and Seed

Cultivar	Node Color % Distinct	Lemma Hairs % Several	Lemma Hairs % Many	Lemma Awn % Present	Palea Hairs % Present	Leaf Blade Margin Hairs % Present	Leaf Sheath Auricle Hairs % Present
(BT:5/8/07) 5001=Epic	44	83	6	100	99	68	40
Boreal	41	83	4	100	99	62	55
Flyer	45	68	15	100	100	48	39
Shademaster	35	68	19	100	96	38	38

■ Cultivar under evaluation
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

Table 4B 2006 Additional Measurements of the Leaf Blade and Seed

Cultivar	Node Color % Distinct	Lemma Hairs % Several	Lemma Hairs % Many	Lemma Awn % Present	Palea Hairs % Present	Leaf Blade Margin Hairs % Present	Leaf Sheath Auricle Hairs % Present
(BT:5/8/07) 5001=Epic	25	84	11	100	100	75	16
Flyer	12	85	2	100	100	85	15
Boreal	21	75	20	100	100	83	3
Shademaster	6	66	18	100	100	79	3

■ Cultivar under evaluation
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

14.

Table 5A 2005 Additional Morphological Measurements

Cultivar	Growth Habit at Anthesis % Erect	Growth Habit at Anthesis % Semi-Erect	Growth Habit at Anthesis % Prostrate	Leaf Blade Anthocyanin % Purple	Leaf Blade Margin Folding % Closed	Leaf Sheath Margins % Open	Leaf Blade Margin Roughness % Smooth	Leaf Blade Margin Roughness % Rough	Seed Weight mg per 1,000 seeds
(BT: 5/8/07) 5001 = Epic	70	30	0	0	92	100	64	36	1226
Boreal	19	81	0	0	93	100	74	26	1402
Flyer	5	95	0	0	95	100	79	21	1215
Shademaster	0	100	0	0	90	100	82	18	1312

■ Cultivar under evaluation
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

Table 5B 2006 Additional Morphological Measurements

Cultivar	Growth Habit at Anthesis % Erect	Growth Habit at Anthesis % Semi-Erect	Growth Habit at Anthesis % Prostrate	Leaf Blade Anthocyanin % Purple	Leaf Blade Margin Folding % Closed	Leaf Sheath Margins % Open	Leaf Blade Margin Roughness % Smooth	Leaf Blade Margin Roughness % Rough	Seed Weight mg per 1,000 seeds
(BT: 5/8/07) 5001 = Epic	66	34	0	0	92	100	64	36	1217
Boreal	23	74	4	0	98	100	68	32	1450
Flyer	49	48	3	0	92	100	84	16	1316
Shademaster	56	44	0	0	91	100	76	24	1321

■ Cultivar under evaluation
Measurements taken in Albany, Oregon
4 reps; 20 plants/rep = 80 data points

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Rutgers, The State University of New Jersey	5001	Epic
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	**5. TELEPHONE** *(Include area code)*	**6. FAX** *(Include area code)*
Foran Hall Plant Biology and Pathology Dept. 59 Dudley Road (ST: 4/12/07) New Burnswick, NJ 08901	(732) 932-9711	(732) 932-9441
	7. PVPO NUMBER # 200700270	

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain.** ☑ **YES** ☐ **NO**

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **If no, give name of country.** ☑ **YES** ☐ **NO**

10. Is the applicant the original owner? ☑ **YES** ☐ **NO** **If no, please answer one of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
☑ **YES** ☐ **NO** **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
☑ **YES** ☐ **NO** **If no, give name of country**

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT F
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	TEMPORARY OR EXPERIMENTAL DESIGNATION
Rutgers, The State University of New Jersey	Foran Hall Plant Biology & Pathology Dept. 59 Dudley Road New Brunswick, NJ 08901	5001 **VARIETY NAME** Epic
NAME OF OWNER REPRESENTATIVE (S)	**ADDRESS** *(Street and No. or RD No., City, State, and Zip Code and Country)*	**FOR OFFICIAL USE ONLY**
Dr. William Meyer	Foran Hall Plant Biology & Pathology Dept. 59 Dudley Road New Brunswick, NJ 08901	**PVPO NUMBER** #200700270

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

W G Meyer
Signature

4/10/07
Date